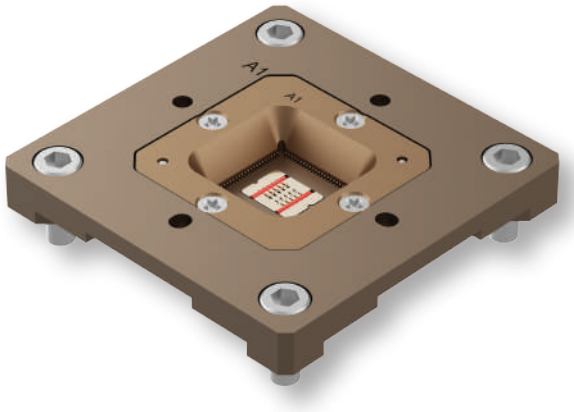
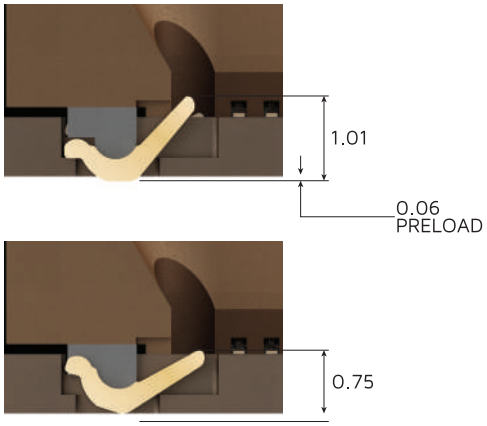
Joule 20 Test Socket

Versatile Interconnect for Leaded and Leadless IC Testing





Smiths Interconnect's Joule 20 test socket provides first-class electrical and mechanical performance in testing Peripheral ICs for the most demanding Analog, RF and Automotive applications.

With a single contact and a single elastomer configuration, Joule 20 failsafe contact technology is an ideal Peripheral Test solution to address the challenges of leadless as well as leaded Matte Tin and NiPdAu devices.

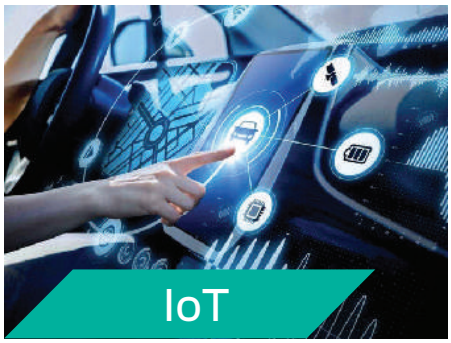
Its innovative design allows for the socket body to be disassembled without removing the socket from the PCB. This enables cleaning and repair to be done without taking production equipment offline, which significantly increases prodution throughput and reduces equipment down-time.

Smiths Interconnect's robust expertise includes decades of socket design experience, detailed thermal, mechanical, and electrical simulation capabilities, and stringent quality assurance protocols, ensuring that your socket is delivered on-time, and performs to specification, every time.

Features and Benefits

- Drop-in socket matching existing PCB socket footprints
- Long contact life, up to 500K insertions
- Extremely short signal path providing high bandwidth up to 20Ghz
- Optimized contact shape ensuring no PCB pad damage
- Tri-Temp Socket designed for (-40°C to +125°C)
- Increased test throughput and reduced test set-up time
- Solid contact structure for optimal DC performance

End Product Markets



Technical Characteristics

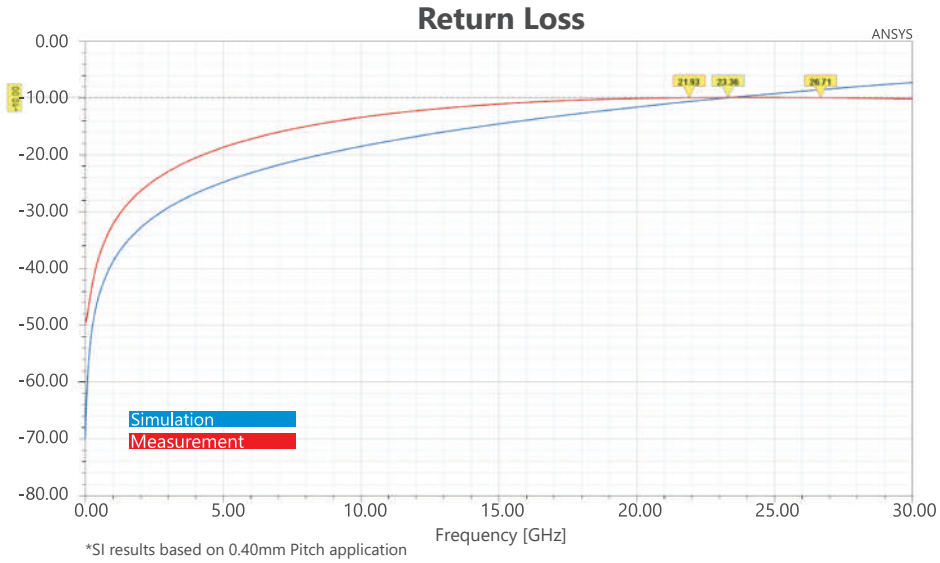
Mechanical Properties

- Typical Application: QFN, QFP, SOIC
- Pitches Accommodated: ≥0.3mm
- Contact Compressed Height: 0.75mm
- Contact Compliance: 0.26mm
- Contact Force: 40~45Grams
- Contact Tip Coplanarity: 0.05mm
- Contact Wiping length: <0.13mm
- Operating Temperature: -40°C ~ 125°C
- Socket Material: Polyimide
- Contact Life: Contacts = 500K+
- Elastomers Life: >300K @ ambient, >250K @ 125°C, 250K @ -40°C
- Socket Housing = 1000K+

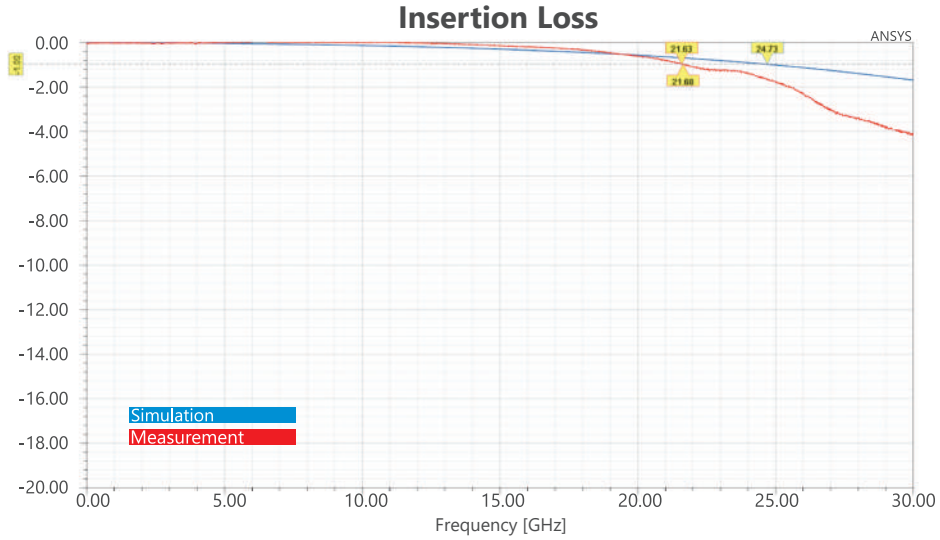
Electrical Properties

- Contact Resistance: <20mOhms @ 500K
- Current Carrying Capacity: 8Amps
- Insertion Loss (GSG): 20GHz @ -1dB
- Return Loss (GSG): 20GHz @ -10dB
- Loop Inductance: 0.42nH
- Capacitance: 0.17pF
- Decoupling Area: 1.40mm

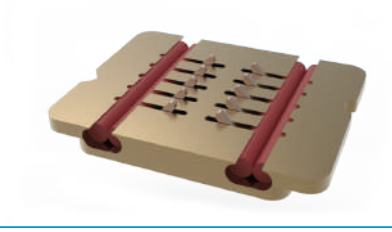
Electrical Performance - GSG Pattern



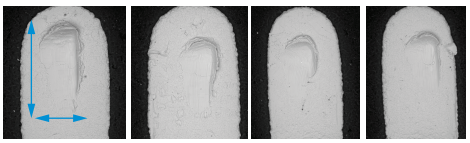
*SI results based on 0.40mm Pitch application



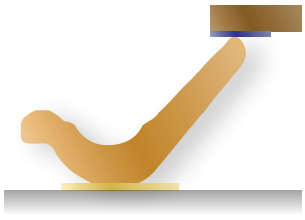
Ground Block Design

		
Type-A	Type-B	Type-C
E/GND Pads size	E/GND Pads size	E/GND Pads size
≥8X8mm GND block can be configured X and Y to be closer to signal contacts per impedance requirement	**≤8X8 to 4X4mm** GND block can be configured X and Y to be closer to signal contacts per impedance requirement	**≤4X4mm** GND block can be configured X and Y to be closer to signal contacts per impedance requirement

Short Wiping Action

Average wipe mark: length ≈ 122µm width ≈ 76µm depth ≈ 3.9µm Pad Material: Matte Tin		■ Increases solderability after test ■ Reduces socket cleaning frequency due to less debris ■ Higher first pass yield
Wiping mark: 300K insertions Average scrub mark: length ≈ 10µm width ≈ 85µm depth ≈ 0.4µm Pad Material: NiPdAu		■ Breaks through surface oxide reliably ■ Consistent contact mark without pad damage

Contact Shape

Conformal Contact (PCB Side): Joule 20 PCB interface design structure optimized to rock on PCB pad vs. gouge or scrub PAD		■ No PCB pad damage ■ Allows for a single elastomer to be used in socket design ■ Generates 20g contact pre-load ■ Facilitates exceptional DC performance of DUT to PCB
Engineered DUT interface: DUT side contact shape optimized for all applications, Matte Tin, NiAu, NiPdAu		■ Breaks through surface oxide reliably ■ Consistent stable contact to DUT ■ Robust life with little shape deformation after 500K insertions ■ Low maintenance required